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# Influence of aerosil on the nuclear magnetic relaxation and translational mobility of dimethyl sulfoxide

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## Abstract

The transverse (T2) and longitudinal (T1) proton magnetic relaxation times and the self-diffusion coefficients D of the dimethyl sulfoxide (DMSO) molecules in aerosil mixtures with different specific surface area were measured at different temperatures and liquid contents. The large difference between the times T1 and T2 in the systems examined is explained by the hypothesis that the molecules adsorbed on the solid surface (especially in micropores) lose some translational degrees of freedom. At high temperatures, the translational displacement of DMSO molecules is determined by the relative time of their residence in the vapor phase. In contrast, it is the surface diffusion that determines this displacement at low temperatures, when the lifetimes of the adsorbed molecules are longer than the times of the measurement of the self-diffusion coefficient.